

Appendix A (clean net claims)

*a<sub>1</sub>* 1. Method for the production of  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grains, characterized by the fact that an aluminum-oxide containing sol is mixed with sinter additives and SiC nanoparticles and subsequently gelled, dried, calcined and sintered the sintering being conducted by heating the mixture in the range between  $1300^\circ\text{C}$  and  $1600^\circ\text{C}$ .

*a<sub>2</sub>* 4. Method according to either of Claims 1 or 2, wherein that prior to the gelling, sintering additives in the form of crystallization seeds, crystal growth inhibitors and/or other modifying components that influence the sintering process are added.

*a<sub>3</sub>* 6. Method according to either of Claims 1 or 2, wherein the gelling of the suspensions occurs by increasing or decreasing the pH value; through aging; the addition of electrolytes; increased temperature; and/or concentrating the solution. -

7. Method according to either of Claims 1 or 2, wherein drying of the gel is carried out in a temperature range between  $50^\circ\text{C}$  and  $120^\circ\text{C}$ , with subsequent calcination between  $500^\circ\text{C}$  and  $800^\circ\text{C}$ , and sintering in a temperature range between  $1300^\circ\text{C}$  and  $1600^\circ\text{C}$ .

*a<sub>4</sub>* 10. Method according to either of Claims 1 or 2, wherein comminution to the desired grain size is done before or after sintering.

*a<sub>5</sub>* 13.  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the SiC particles are predominantly present intragranularly in the  $\text{Al}_2\text{O}_3$  matrix.

14.  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the  $\text{Al}_2\text{O}_3$  crystals of the matrix show mean diameters of between  $0.2\ \mu\text{m}$  and  $20\ \mu\text{m}$ .

15.  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 11 or 12, wherein the  $\text{Al}_2\text{O}_3$  matrix has a submicron structure and a mean particle size of  $< 1\ \mu\text{m}$ , preferably  $< 0.5\ \mu\text{m}$ .

*a<sub>6</sub>* 19.  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grain according to either of Claims 16 through 18, wherein the coarse  $\text{Al}_2\text{O}_3$  crystals have a length/width ratio of between 2:1 and 10:1, preferably between 4:1 and 6:1.

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b  
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20. Utilization of  $\text{Al}_2\text{O}_3/\text{SiC}$  nanocomposite abrasive grains according to Claim 11 in combination with backing substrates or materials to comprise grinding belts or grinding disks.

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